

NISTTech

Process For UV-Photopatterning of Thiolate Monolayers Self-Assembled On Gold, Silver and Other Substrates

Applications

- **The ability to bind biological species such as proteins, enzymes, DNA and cells at known locations on surfaces**
Used for a variety of technologies including biosensing, immunoassay diagnostics, DNA probe diagnostics and sequencing, pharmacological and toxicological testing, and cell growth studies.
- **Biosensing**
the ability to pattern and immobilize multiple proteins on surfaces would allow the construction of miniaturized, multi-analyte sensors capable of operating in blood vessels or on a single cell.
- **DNA Sequencing**
the ability to immobilize DNA probes on surfaces with would be a key step in the fabrication of a new generation of miniaturized DNA sequencers supported on micro-chips.

Abstract

A process for creating a two dimensional spacial distribution pattern of ferent thiolate molecules on a substrate by illuminating a surface of a self-assembled monolayer of a first thiolate compound in the presence of oxygen with high frequency electromagnetic radiation distributed according to a desired pattern, and subsequently immersing the illuminated substrate in a solution of a second thiolate compound so that molecules of the first thiolate compound in illuminated areas of the monolayer are exchanged for molecules of said second thiolate compound; and a patterned biomolecular composite formed of a substrate which forms a self-assembled thiolate monolayer when immersed in a solution of a thiolate forming compound, a thiolate monolayer deposited on the substrate and composed of patterned areas of first and second thiolate compounds, respectively, the first thiolate compound having an affinity for specifically or nonspecifically adsorbing a biological molecule, and the second thiolate compound having essentially no affinity for the biological molecule, and at least one biological material adsorbed in a corresponding pattern on the patterned areas of the first thiolate compound in the thiolate monolayer.

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Citations

1. D. Piscevic, W. Knoll, and M.J. Tarlov. Surface Plasmon microscopy of biotin-streptavidin binding reactions on UV-photopatterned alkanethiol self-assembled monolayers. *Supramolecular Science*. Vol. 2, Issue 2, 1995, Pages 99-106.

References

- U.S. Patent # 5,514,501
- Docket: 93-047US

Status of Availability

This invention is available for exclusive or non-exclusive commercialization licensing. Collaborative research opportunities are available.

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